

REMARKS

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Claims 1, 7, 13, 14, 178, 19-21, 24 and 26-29 are presented for examination.

Claims 1 and 7, the independent claims, and Claims 17, 19, 21, 24, 26 and 28 have been amended to define more clearly what Applicant regards as his invention. The changes made to the claims are intended merely to clarify still further what Applicant was already claiming, and these changes are not intended, or believed, to narrow any claim element. Favorable reconsideration is requested.

Claims 1, 7, 13, 17, 19, 20, 24, 26 and 27 were rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patent 5,506,401 (Segawa) in view of U.S. Patent 6,396,116 (Kelley) and U.S. Patent 6,262,513 (Furukawa), and Claims 14, 21, 28 and 29 were rejected under Section 103(a) as being obvious from those patents, further in view of U.S. Patent 5,138,145 (Nakamura et al.).

Independent Claim 1 is directed to a solid-state image pickup device that comprises two substrates, one of which is a supporting substrate that is provided with no wiring, and the other of which is a wiring substrate. Also provided are a solid-state image pickup element chip on which a plurality of solid-state image pickup elements are mounted, the solid-state image device pickup element chip being formed on a light incident side of the supporting substrate, and a protection cap provided on a light incident side of the solid-state image pickup element chip and adapted to protect that chip. Also, according to Claim 1, the wiring substrate is formed of a flexible material and is connected electrically to the solid-state image pickup element chip. Moreover, a connection between the solid-state image pickup element chip and the wiring substrate is fixed only at a bump formed on an electrode pad, and the supporting substrate has a thermal expansion

coefficient substantially equal to that of the protection cap, and the supporting substrate and the protection cap are sealed with a sealing resin, so as to form a structure having a hollow space between the solid-state image pickup element chip and the protection cap.

The Office Action asserts that “a solid-state image pickup element chip (112) ... [is] formed on a light incident side of said substrate” in *Segawa* ‘589. However, in Applicant’s view, *Segawa* ‘589 falls even to have any supporting substrate itself, as is apparent from a review of the embodiments discussed in that patent. The *Segawa* ‘589 structure includes a sensor chip (112), a wiring substrate (102) and a protection cap (101; see Fig. 7). Nothing shown or discussed in that patent corresponds to “a supporting substrate, provided with no wiring”, as recited in Claim 1.

The Office Action cites *Kelly* as disclosing, in Fig. 4A, a substrate (430) provided with no wiring which supports a substrate (406) having a semiconductor element (404) and a protection cap (416). However, as is apparent from Fig. 4A of *Kelley*, the substrate 430 is electrically connected through a solder ball (436) and a contact pad (432, 438) to the wiring substrate (412) connected to a sensor chip, and is so described also at col. 5, lines 56-58. Since element 430 is referred to as “the circuit board”, it seems plain that element 430 constitutes wiring and has an electrical connection function.

In a structure constructed according to Claim 1, in contrast, the supporting substrate does not perform such electrical wiring function, and it is unnecessary to provide electrical connections through such a solder ball (436) and contact pads (432, 438). In particular, in a case of using a member such as the solder ball (436), which tends to promote rigidity in the structure, as the electrical connection member, undesirable stress would be exerted on the sensor chip, while according to the structure of Claim 1, such

stress would not be caused, and the sensor chip can be packaged without warping of it. This is an advantage of the structure of Claim 1 that cannot be provided by *Segawa* '589 and *Kelly*, even taken in combination (even assuming for argument's sake that any such combination of these patents would be permissible).

Further, according to *Kelly*, since the sensor chip and the wiring substrate (412) are connected by a pad, and bump and further by an adhesive (434) on undesirably, greater stress would be exerted on the sensor chip as compared to a case of connection by the bump, as in Claim 1.

The Office Action also cited *Furukawa*, as disclosing the recited wiring substrate made of glass. Even if this be deemed to be so, however, nothing has been found or pointed out in *Furukawa* that would teach or suggest a supporting substrate provided with no wiring, as recited in Claim 1. Accordingly, even assuming the proposed combination of these three patents would be proper, the result would still not meet the terms of Claim 1, and that claim is deemed clearly allowable over those three patents.

Independent Claim 7 recites features similar to those discussed above with respect to Claim 1 and therefore is also believed to be patentable over the prior art discussed above, for the reasons discussed above.

A review of the other art of record, including *Nakagawa*, has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or the other of the independent claims discussed above and are therefore believed patentable for

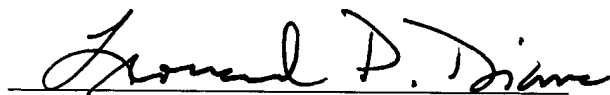
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the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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